



DeepFocus Acoustic Microscope Transducer: New scanning process catapults image quality

In Star Trek, Captain Kirk's scanning tricorder tells him what's happening.

Now, researchers in Idaho have invented a highly sensitive acoustic microscope that delivers images with a depth of field over 60 times greater than ever before.

This scanning requires no material preparation and does no harm, even to human tissue.

The DeepFocus Acoustic Microscope sets new standards for producing extremely fast acoustic wave generation rise and fall times.

By using a proprietary pulser-receiver that for the first time has been integrated with a transducer, material can be successfully characterized, even over less-than-smooth surfaces.

This breakthrough catapults nondestructive testing forward by delivering images of precise conditions and slashing costs in manufacturing and operations.

"It really has the opportunity to revolutionize the nondestructive testing on materials," said INL scientist Stephen Taylor.

As with many advances, this research has its origins in national laboratory efforts.

"The first application is in the nuclear field. This particular device here will be inspecting fuel prior to going into the reactor to validate the thickness of the clad over the fuel."

But, it also offers never-before contemplated applications.

"We also feel it can be used in the medical field for inspecting such items as a pacemaker."

Other key advantages over conventional transducer testing include:

- Delivers more than twice the resolution and sensitivity.
- Operates at a much higher frequency.
- Reduces physical constraints.

- More compact
- Smaller and 15 times lighter
- DeepFocus is about the size of a maglite.

- Increases productivity as one scan replaces over 60
- Reduces total costs including manufacturing, set up and operation.

Ensuring quality end unit production is extremely important and each configuration is profiled using sensitive tests to ensure it meets specifications.

“We’ve now reached a standard that we believe we can mass produce these,” said INL scientist Nancy Kraft.

Going further than ever before, DeepFocus offers a glimpse into our future.